

WHAT IS THE CORRECT NAME FOR THE BRISTLY GREENBRIER?

ROBERT L. WILBUR

Department of Biology, Duke University, Durham, NC 27708
e-mail: rwilbur@duke.edu

ABSTRACT. The scientific name of Bristly Greenbrier, a widespread species in eastern North America, has been unsettled for at least the past six decades with *Smilax tamnoides* and *S. hispida* both strongly competing for acceptance in scores of books, papers, and checklists. Neither binomial as currently employed can withstand nomenclatural scrutiny. The correct name determined in the present study is *S. hispida* Raf., a binomial with three years priority over *S. hispida* Muhl. ex Torrey.

Key Words: *Smilax tamnoides*, *S. hispida*, *S. pandurata*, Bristly Greenbrier, Smilacaceae

In eastern North American floras, checklists, and atlases, two different binomials are widely employed to designate the common and widespread Bristly Smilax or Greenbrier. Both *Smilax tamnoides* and *S. hispida* have received strong support, as shown by the sampling of the literature listed in the following paragraph. However, neither of these binomials, as employed for the past six decades, withstands close examination.

Publications employing the binomial *Smilax tamnoides* L. to designate the Bristly Greenbrier include Alford (2001), Clewell (1985), Diggs et al. (1999), Duncan (1967, 1975), Duncan and Kartesz (1981), Fernald (1944, 1950), Godfrey (1988), Godfrey and Wooten (1979), Harvill et al. (1986), Judd (1998), Kartesz (1994), Kartesz and Kartesz (1980), Radford et al. (1968), Smith (1988), Steyermark (1962), Voss (1972; although expressing considerable doubt), Wofford (1989), Wofford and Kral (1993), Wunderlin (1982, 1998), and Yates and Duncan (1970). Those who accepted the binomial *S. hispida* as the name for the Bristly Greenbrier include Braun (1943), Browne and Athey (1992), Clausen (1951), Coker (1944), Correll and Johnston (1970), Deam (1940), Gleason (1952), Gleason and Cronquist (1963, 1991), The Great Plains Flora Association (1977, 1986), Holmgren (1998), Jones and Coile (1979, 1988), Jones and Fuller (1955), Mitchell (1986), Mohlenbrock (1970), Mohlenbrock and Ladd (1978), Ownbey and Morley (1991), Rehder (1949), Rhoades and Klein (1993), Small (1933), Strausbaugh and Core (1952, 1978), Tatnall (1946), Thomas and Allen (1993), Van Bruggen (1976, 1985), Wetter et al. (2001), Wherry et al. (1979), Wilbur (1990), Yatskievych (1999), and Yatskievych and

Turner (1990). MacRoberts (1984, p. 38) listed the binomials of both *S. tamnoides* and *S. hispida* as part of the flora of Louisiana. Although more authors have employed the binomial *S. hispida* than *S. tamnoides* over the past six decades, a very strong minority has adopted the binomial *S. tamnoides* as the name for the widespread Bristly Greenbrier. Clearly the application of the two different binomials for the same species leads to confusion and is contrary to Principle IV of the International Code (Greuter et al. 2000).

Although Linnaeus had had little contact with either specimens or prior published accounts or illustrations of what became his *Smilax tamnoides* prior to the publication of its protologue, that binomial then got off to a muddled start and the confusion has persisted for 250 years. Linnaeus's descriptive polynomial included the information that the stem was armed, as did Catesby's polynomial included in the synonymy. Nothing in the protologue pointed to any of the nonwoody smilaxes. The binomial initially was based in part upon a recently received specimen of Pehr Kalm's, then and now preserved in the Linnaean herbarium, originating from the mid-Atlantic area, perhaps New Jersey or Delaware (Fernald 1944, p. 33), and in addition upon the description together with the illustration of Mark Catesby of plants probably encountered in South Carolina. Kalm's specimen was a member of the herbaceous-stemmed section whose members always lack prickles, while Catesby's plant was from the woody section, often with prickly stems and/or leaves. Cauline prickles are clearly indicated in Catesby's published plate (1730, 1: t. 52.). The binomial *S. tamnoides* was grouped by Linnaeus with four other lianoid species all possessing perennial, armed stems, the group designated by Linnaeus as "*Caule aculeato, tereti.*" The only specimen in the Linnaean herbarium named *S. tamnoides* has proven, according to Fernald (1944, p. 33), to be an unarmed herbaceous species that Linnaeus actually named, in the same publication and based on another specimen, as *S. pseudo-china*. Obviously Kalm's specimen was misplaced in Linnaeus's account and belonged under the heading "*Caule inermi, tereti*" and had nothing to do with the woody, prickly stemmed species being discussed in this note. Although not included in the Linnaean protologue of *S. tamnoides*, Kalm's specimen of *S. pseudo-china* in the Linnaean herbarium did add to the confusion surrounding *S. tamnoides*. Michaux (1803) did not include *S. tamnoides* in any manner. Pursh (1814) treated *S. tamnoides* as an herbaceous-stemmed species, citing both Willdenow (1806, 4: 780) and Catesby (1730, 1: t. 52.) in its synonymy, even though both described their plants as woody and spiny, as did Linnaeus. It is to be

remembered that Pursh wrote his flora while living in London where he had access to the Linnaean Herbarium. The Kalm specimen there was identified as *S. tamnoides*, a woody species, including that misidentified specimen of Kalm's masquerading as *S. tamnoides*, although that specimen was actually *S. tamnifolia* Michx. (= *S. pseudo-china*). Elliott (1824), publishing a decade after Pursh (1814), was not misled by Pursh's interpretation of the Linnaean binomial but instead treated *S. tamnoides* as applying to a prickly, woody-stemmed species.

After chiding Linnaeus for failing to understand his own species, *Smilax tamnoides*, Fernald (1944) pointed out that "there can be no question that the type of *S. tamnoides* was the Catesby plate" (i.e., 1: t. 52 together with the accompanying descriptive material on the page opposite the plate). Howard and Staples (1983, p. 517) stated that "a specimen obtained by Kalm (LINN 1132.10) is preferable as lectotype" of *S. tamnoides*. Fernald (1944, pp. 33-34, 38) had earlier identified the only specimen in the Linnaean Herbarium, originally labeled as *S. tamnoides*, to be the herbaceous-stemmed, nonprickly *S. pseudo-china*. Clearly, Howard and Staples overlooked this fact in suggesting that the annual-stemmed specimen in the Linnaean Herbarium would be a better lectotype for *S. tamnoides* than the Catesby plate, even with its obvious deficiencies in biological depiction. Although the Kalm specimen was available to Linnaeus prior to the publication of *Species Plantarum*, Kalm's collection was not cited by Linnaeus. In fact, because the herbaceous-stemmed plant in the Linnaean Herbarium conflicts strongly with the characteristics included by Linnaeus in the protologue of the species, the lectotype suggested by Howard and Staples for *S. tamnoides* would reestablish the misapplication of the name. Elliott (1824, p. 701) considered *S. tamnoides* to be a prickly, woody-stemmed vine with slightly panduriform, 5-nerved leaves. He included in its synonymy *S. panduratus* (sic!) Pursh, even though that species was described by Pursh as three-nerved.

Clausen (1951) criticized Fernald's acceptance of Catesby's illustration that Fernald (1944, p. 38) had stated "was a beautiful match for the terete stemmed plant, with relatively thin though firm, and delicately veined, often panduriform leaves, and elongate, arching and finally drooping peduncles (up to 6.5 cm long) and long pedicels . . ." Coker (1944, p. 30) reached a different conclusion as to the identity of Catesby's plate 1: 52, claiming that it "illustrates the herbaceous *S. (Nemexia) tamnifolia*." To reach such a conclusion, Coker would have had to overlook the prominent prickles clearly displayed in Catesby's rather crude illustration and whose presence is clearly stated in

Catesby's accompanying Latin polynomial. Clausen challenged Fernald's conclusion that Catesby's illustration was a perfect match for the Bristly Greenbrier "since it has the long peduncles and clusters of 25–32 fruits characteristic of *S. Psuedo-China*, but prickles and leaves as in *S. Bona-nox*. The prickles are sparse, slender, broadest at the base, and green, quite unlike the abundant black bristles of *S. hispida*." Coker (1944, pp. 30, 46) also noted that Catesby erred in attributing tuberous underground parts to the species that Linnaeus named *S. tamnoides*. Coker, whose studies especially focused on the differences in the underground organs of *Smilax*, pointed out that that species does not have tubers. Coker then suggested that the tubers discussed by Catesby must belong to either *S. lanceolata* L. or *S. auriculata* Walter, Clausen stated that the features illustrated or described in Catesby's account were derived from several species and that probably no species existed with the combination of characteristics described or illustrated by Catesby. Clausen found that it was impossible to identify Catesby's account of *Smilax bryoniae nigrae foliis; caule spinoso, baccis nigris*, the sole cited synonym of Linnaeus's protologue of *S. tamnoides* (1753, 2: 1030). Clausen concluded his analysis by proposing that *S. tamnoides* be treated as an ambiguous name and doubtless his recommendation is the reason that a majority of the publications of the later half of the twentieth century took up the binomial *S. hispida*. I agree that Linnaeus's account of *S. tamnoides* is not a reasonable match for the Bristly Greenbrier.

Clearly it would be no easy task to select a lectotype for *Smilax tamnoides* considering its very confused history. It surely would have been better if Fernald had followed his own convictions (1944, p. 41): "One sometimes doubts the wisdom of starting our nomenclature of American plants with Linnaeus (1753). It is almost an exceptional North American species about which he was not hopelessly confused." Still, the International Code of Botanical Nomenclature now gives us almost *carte blanche* to salvage almost any name by lectotypification or to reject it completely in order to maintain stability in nomenclature. Obviously such license is to be used judiciously, and fortunately the published proposed resolution is reviewed in succession by at least two international committees.

During the first four decades of the twentieth century, authors almost universally employed the binomial *Smilax hispida*, as was the practice for much of the previous century. However, during the last half of the twentieth century, as is shown in the second paragraph of this paper, authors were strongly divided in usage between *S. tamnoides* and *S. hispida*. Since there are clearly very serious nomenclatural problems

with *S. tamnoides*, we ought now to examine the history of *S. hispida*. It was first published in Muhlenberg's *Catalogue* (1813) but, like almost all new binomials in that publication, it appeared there as a *nomen nudum*, and hence the name was not validly published (Greuter et al. 2000; Merrill and Hu 1949). Muhlenberg's binomial still appears in the literature as *S. hispida* Muhl., and also as *S. hispida* Muhl. ex Willd. and *S. hispida* Muhl. ex Torr. (1843). The first version attributes the valid publication of the binomial to Muhlenberg who, as we have seen, merely published a binomial without either a diagnosis or a reference to a validly published diagnosis (Merrill and Hu 1949). I have never found a reference to a valid publication of the binomial *S. hispida* Muhl. ex Willd. The third version, *S. hispida* Muhl. ex Torr., would be correct except that Rafinesque (1840) had earlier validly published *S. hispida* Raf. with no reference to Muhlenberg. Rafinesque's binomial is certainly the same species as that intended by Muhlenberg. Rafinesque's descriptive account is sufficient, as shown below, and can be identified with certainty.

925. *Smilax O. hispida* Raf. ramis striatis hispidis basi teretis, apice angulatis, fol. cordatis petiol tenuis concolor acutis 5 nervis reticul. laevigatis margine scabris.—West Kentucky, very distinct by many flexible bristles instead of prickles, leaves very thin, well cordate, 2 or 3 inches long, edges very rough.

The "O." appearing between the generic name and the specific epithet in Rafinesque's description is explained by him in his preceding paragraph: "... the real *Smilax* includes 2 subg. *Oplax* more or less aculeate, *Luiste* inerme." Unfortunately, as with so many of Rafinesque's binomials, no one has yet found authentic material. In spite of this deficiency, I believe Rafinesque's description certainly can be applied only to the same species that Muhlenberg intended to so name but failed to describe. Rafinesque's publication (1840) of *S. hispida* has three years' priority over the publication *S. hispida* Muhl. ex Torr. It is somewhat ironic to find Rafinesque claiming *S. hispida* as his own species, since he bitterly and repeatedly criticized Pursh for publishing *Drosera filiformis* as his own species and not attributing it to Rafinesque, who had originally collected the species and described it prior to Pursh's account. Rafinesque (1840) made no mention in publishing *S. hispida* Raf. that Muhlenberg (1813) had published the same binomial, although without a description.

An even earlier name that remains unaccounted for is *Smilax pandurata* Pursh (1814, as *panduratus*). Elliott (1824, p. 701) placed

Pursh's binomial in the synonymy of the woody vine *S. tamnoides*, although Pursh originally described *S. pandurata* as having 3-nerved leaves while Elliott stated that *S. tamnoides* had 5-nerved leaves. In contrast, Morong (1895) included *S. pandurata* in the synonymy of *S. bona-nox* L. and Alphonse de Candolle (1878) treated Pursh's species as a subspecies of *S. bona-nox*. Without authentic material of Pursh of this *Smilax* it is impossible to determine precisely what Pursh had, as the protologue of *S. pandurata* does not provide the information that one must have to determine which species Pursh was describing. Pursh's account is presented in full below. It appeared under the second of the three species groupings employed by Pursh: “***Caule fruticoso; ramis teretibus.*”

14. *S. aculeata*; foliis ovato-panduraeformibus acuminatis *panduratus*.
 3-nervibus, pedunculo communi petiolo duplo longiore.
 In sandy woods: New Jersey to Carolina. ___ July. v.v.
 Leaves smooth and shining on both sides.

It seems unlikely that authentic material of Pursh's *Smilax pandurata* will ever be found. Ewan (1979) indicated in the introductory essay for the Cramer reprint of Pursh's *Flora*, that he had sought widely for the specimens upon which Pursh based his *Flora*, both in Philadelphia, as well as elsewhere in the United States and Europe, with limited success. He had no success in finding authentic material for *S. pandurata*, stating: “*S. panduratus* (251) not located. Fernald [1944, p. 39] = “*S. tamnoides* L.” Fernald (1944, p. 39) was as usual for him, positively certain as to the identity of “*S. panduratus*” Pursh: “Pursh's brief description could have applied only to typical *S. tamnoides*.”

Pursh's failure to describe the unique bristly trichomes on the lower stems of the Bristly Smilax and his description of the 3-nerved leaves (instead of 5-nerved as usually noted for that species) make me much less certain of the identity of Pursh's *Smilax paniculata* than was Fernald. The rounded branchlets noted by Pursh for *S. paniculata* match well with those of the Bristly Greenbrier as does the described ratio of peduncle length to the subtending petiole length. However, without authentic specimens or type material, it seems impossible to establish the identity of *S. pandurata* Pursh with any certainty. Consequently it seems we have no recourse but to leave Pursh's binomial with the rather lengthy list of *Smilax* names impossible to place in synonymy (i.e., the listings of *Nomina Dubia*). The Rafinesque binomial also lacks a type specimen, but its description seems unquestionably to apply to the Bristly Greenbrier.

The synonymy of the Bristly Greenbrier hence appears to be as follows:

Smilax hispida Raf., *Autikon Bot.* 125. 1840.

S. hispida Muhl. *ex Torr.*, *Fl. N. York* 2: 302. 1843.

S. grandifolia Buckley, *Amer. J. Sci. Ser. 1.* 45: 171. 1843.

S. hispida [rankless] *australis* Small, *Man. S. E. Fl.* 312. 1933.

S. tamnoides var. *hispida* Fernald, *Rhodora* 46: 38. 1944.

S. hispida var. *australis* (Small) Coker, *J. Elisha Mitchell Sci. Soc.* 60: 48. 1944.

S. hispida Muhl., *Cat. Pl. Amer. Sept.* (ed. 1) 92. 1813. *nom. invalid.*, Art. 32.1c.

S. hispida var. *montana* Coker, *J. Elisha Mitchell Sci. Soc.* 60: 49. 1944. *nom. invalid.*, Art. 36.

It has been suggested that the above synonyms ought to have their types indicated or, if the types are lost, to provide neotypes. I am not prepared to do so at this time. It would be easy to name one of my own collections as a neotype of Rafinesque's species as we can be rather certain that a type will not be found. It would seem to better serve systematics to choose a neotype after making a broad survey of herbaria and then to choose a specimen that had numerous duplicates and those widely distributed. I think the above synonymy is useful and that the suggested typifications can be more judiciously selected at a later time.

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